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Volatility in stock returns for new EU member states: Markov regime switching model

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Abstract

In this paper, we investigate the volatility in stock markets for the new European Union (EU) member states of the Czech Republic, Hungary, Poland, Slovenia and Slovakia by utilising the Markov regime switching model. The model detects that there are two or three volatility states for the emerging stock markets. The result reveals that there is a tendency that the emerging stock markets move from the high volatility regime in the earlier period of transition into the low volatility regime as they move into the EU. Entry to the EU appears to be associated with a reduction of volatility in unstable emerging markets.
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1. Introduction

In Central and Eastern European counties (CEEC) with an end of communism and the reconstruction of their economies in the 1990s, amongst other things, a massive exercise in privatization has taken place. It is difficult to imagine that the volatility in stock markets is not affected by the extent of the restructuring of these economies in the post communist period. Along with the privatisation, the transition economies have gone through frequent exchange rate regime changes from a fixed exchange rate regime with varying bands to a managed or full floating rate

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system. The different exchange rate system may often be the cause of unstable fundamentals, which are then transmitted to stock markets. Theoretically and empirically, there is a close relationship found between stock prices and exchange rates.[2] More recently, having accomplished the entry to the European Union (EU) in May, 2004, the on-going economic integration with the EU may have considerably affected the fundamentals in the new EU member states. Entry to the EU is potentially a strong factor in affecting volatility, since it implies an advance of trade, while potentially facilitating commodity, capital and factor market integration among member states. Entry to the EU has clearly changed the landscape of both the real and monetary sectors in the new EU economies. Economic theory predicts that such structural changes in fundamentals may be associated with the changes in the behaviour of stock markets. Stock prices should reflect expectations of future dividends, interest rates and risk premia (Campbell & Shiller, 1988 and Campbell & Ammer, 1993), which in turn depend on macroeconomic conditions. It follows that both first and second moments of returns should be affected by these events to the extent that they affect fundamentals (Morana & Beltratti, 2002).

In this paper, we investigate the extent of volatility in the stock markets for the new EU member states by utilising the Markov regime switching model put forward by Hamilton (1989). This model allows the variance of stock returns to switch across different states, taking into account any changes in the variance over the sample period. It is based on the assumption that the stock return may move across different volatility regimes, which are characterized by the different perceptions of market participants in the stock market: Market participants would constitute some form of expectations in fundamentals, which are in turn translated into stock prices. For example, in terms of the entry to the EU, although the date of entry to the EU is known with certainty, the timing of the potential change in the expectation is not known. The Markov model, therefore, provides an empirically plausible framework for examining the volatility of returns in the evolving stock returns.

The empirical literature on the Markov switching models applied to stock markets in the CEEC is very limited, except for the works of e.g. Linne (2002) and Bialkowski (2004). Linne (2002) investigates the contagion effect of currency crises on several CEEC by using the multivariate Markov switching model introduced by Krolzig (1999) for a relatively short time horizon of 1997–2000 using weekly data. Bialkowski (2004) examines the time series behaviour of stock returns of three CEEC using less frequent monthly data for the period of 1995–2002, where two or three volatility states are observed. The current research extends previous research by including five of the largest CEEC, namely, the Czech Republic, Hungary, Poland, Slovenia and Slovakia, to explore the regime switching behaviour of volatility of stock returns, and our sample period covers the recent period of 1994–2006, which allows us to investigate the consequences of the convergence process for the emerging stock markets,[3] and this is a special interest in this paper. The model detects that there are two or three volatility states found for these stock markets. Empirical evidence reveals that there is a tendency that these markets move from the high

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[2] Uncovered Interest rate Parity suggests that the expectations of relative currency values influence the levels of domestic and foreign interest rates. This, in turn, affects the cost of capital, and therefore the profitability of a firm, and consequently the present value of the firm may change, affecting its share price. The interaction between the two variables can also arise through the effects on price competitiveness or on input costs. See, for example, Abdalla and Murinde (1997), Ajayi, Friedman, and Mehdian (1998), Smyth and Nandha (2003) and Moore (in press).

[3] The Markov switching model was utilised by Morana and Beltratti (2002) in investigating the volatility relating to the introduction of the euro for France, Germany, Spain, Italy, UK and USA. They find a clear switching of volatility states associated with the euro for stock returns.

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